

ABSTRACT

A method of depositing organic material is provided. A carrier gas carrying an organic material is ejected from a nozzle at a flow velocity that is at least 10 % of the thermal velocity of the carrier gas, such that the organic material is deposited onto a substrate. In some embodiments, the dynamic pressure in a region between the nozzle and the substrate surrounding the carrier gas is at least 1 Torr, and more preferably 10 Torr, during the ejection. In some embodiments, a guard flow is provided around the carrier gas. In some embodiments, the background pressure is at least about $10\text{e-}3$ Torr, more preferably about 0.1 Torr, more preferably about 1 Torr, more preferably about 10 Torr, more preferably about 100 Torr, and most preferably about 760 Torr. A device is also provided. The device includes a nozzle, which further includes a nozzle tube having a first exhaust aperture and a first gas inlet; and a jacket surrounding the nozzle tube, the jacket having a second exhaust aperture and a second gas inlet. The second exhaust aperture completely surrounds the first tube aperture. A carrier gas source and an organic source vessel may be connected to the first gas inlet. A guard flow gas source may be connected to the second gas inlet. The device may include an array of such nozzles.